Data Storage

Floating Point Notation

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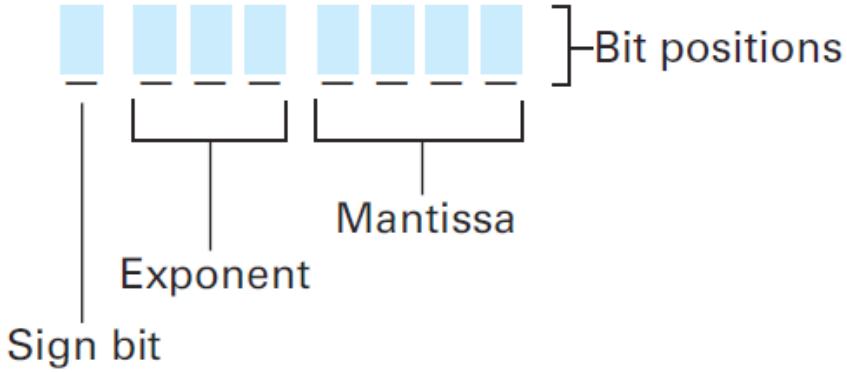
Floating Point Notation

Storing Radix

- ✓ Numbers with fractional part have a radix, so its important to store the position of Radix
- ✓ One popular way is floating-point notation
- ✓ For demonstration purpose we will use examples of 8 bits storage system.

Floating Point Notation

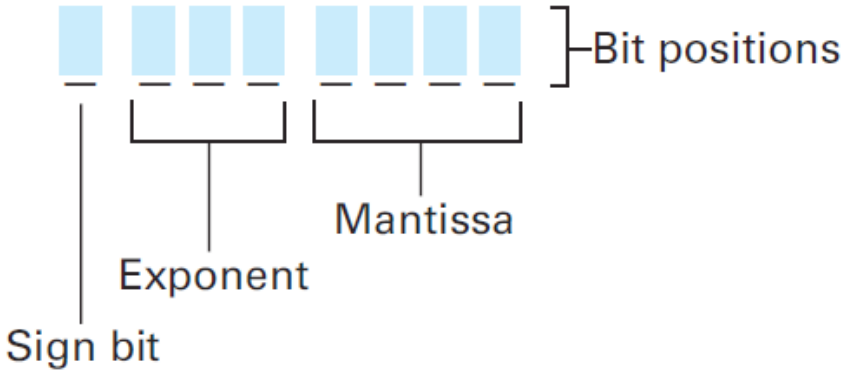
Storing Fractions



- ✓ Sign bit
- ✓ Exponent field
- ✓ Mantissa field

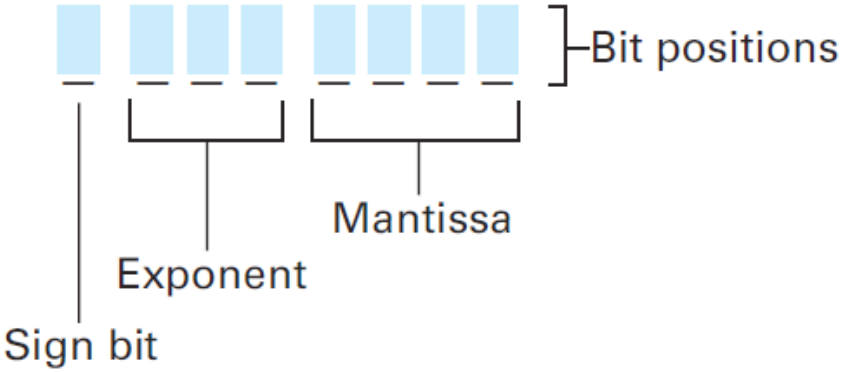
Example to retrieve data

Understanding Stored Fractions



- ✓ Suppose a number is stored 01101011

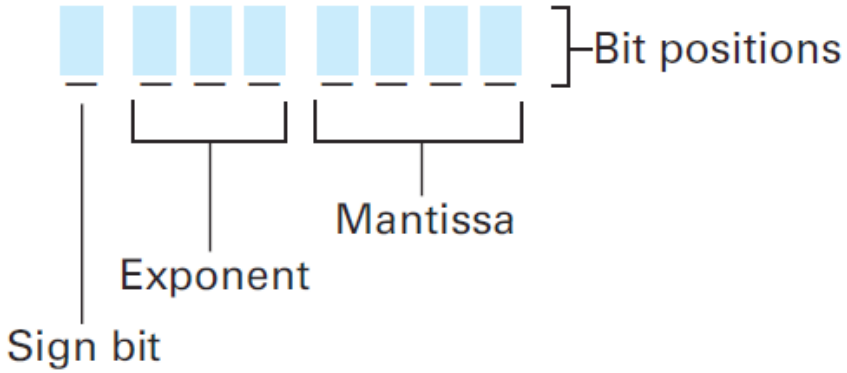
Example to retrieve data



Understanding Stored Fractions

- ✓ Suppose a number is stored 00111100

Example to store data



Storing Fractions

- ✓ Suppose a number is stored 1 1/8

Storing Fractions

Normalized Form

- Suppose you want to store 3/8, the mantissa would be .011, but mantissa would be 1100 not 0110, so we start storing from first left 1.
- both 00111100 and 01000110 would be decoded as 3/8, the first one is in normalized form

Summary

Floating Point Notation

- ✓ Storing fractions
- ✓ Sign bit, Exponent, Mantissa
- ✓ How to store and retrieve data in floating point